

A NEW TREE SNAIL, GENUS *DRYMAEUS* (BULIMULIDAE) FROM SOUTHEASTERN PERU

Fred G. Thompson and Jane E. Deisler

Abstract.—*Drymaeus aurantiostomus*, n. sp. is described from Madre de Dios Province, Peru. It belongs to the *D. expansus* species group and is the southernmost member of the group.

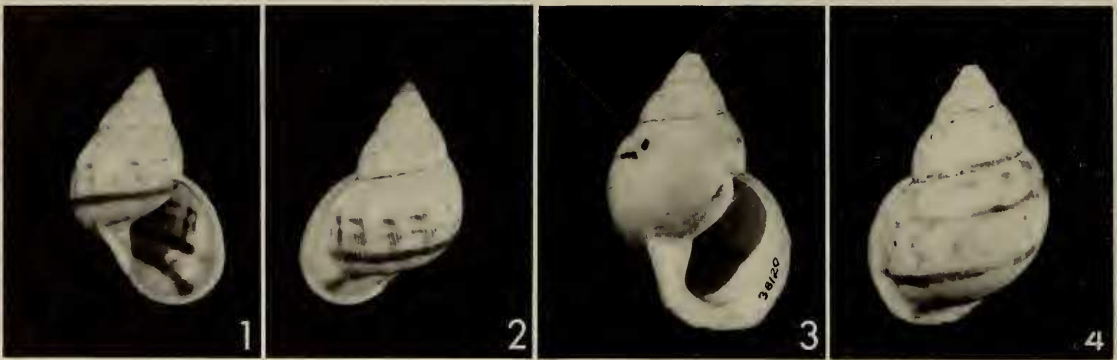
In this paper we describe a new species of tree snail belonging to a group that is widely distributed in the Andean region of northwestern South America and adjacent Panama. The snail comes from the Department of Madre de Dios in southeastern Peru and is the southernmost member of the species group to which it belongs. The molluscan fauna of this department is very poorly known. No paper deals specifically with the region. We are grateful to Roy W. McDiarmid, Department of Amphibians and Reptiles, National Museum of Natural History for sending us the snail for study and to Alan Solem, Field Museum of Natural History (FMNH) for the loan of comparative specimens.

Drymaeus aurantiostomus new species

Figs. 1, 2, 5, 6

Diagnosis.—A species of the subgenus *Drymaeus* Albers, and of the *expansus* species group because of its broadly expanded peristome, it has a relatively rugose axial sculpture and a compressed imperforate umbilicus. It differs from related species by its color. It is white with a subperipheral and basal spiral band, and a spiral series of rust colored flames above each band. The interior of the peristome is bright yellow, thus the Latin derivation of the specific name *aurantiostomus*.

Shell (Figs. 1, 2).—Medium sized, about 30 mm long; conical with a broadly reflected peristome. Thin, weakly translucent. Spire nearly straight-sided. Umbilicus compressed-rimate. Whorls 5.8, nearly flat-sided with a distinct but weakly impressed subperipheral suture. Whorls regularly increasing in size and descent; insertion of peristome rising onto periphery of previous whorl; 2.1 embryonic whorls. Post embryonic whorls sculptured with distinct, regularly spaced, axial riblets that are crossed by much finer incised spiral striations; axial sculpture strongest on last whorl behind lip. Peristome broadly expanded throughout, conspicuously dilated baso-laterally. Aperture oblique in lateral profile, lying at about 22° to shell axis, nearly tangential to body whorl. Columellar lip broadly expanded in front of umbilical area. Columella straight, nearly vertical. Color: Embryonic whorls grayish yellow; postembryonic whorls white with a subperipheral and a basal purple band on last whorl; each band bordered above by regularly spaced rusty flames; those above subperipheral band continuing on to penultimate whorl as a series of small reddish brown spots (Fig. 2); interior of aperture white with outer bands and flames clearly distinguishable. Peristome with a broad yellow zone that continues onto columella; edge of peristome white. Parietal callus thin, clear, colorless.



Figs. 1–4. *Drymaeus* spp.: 1, 2, *D. aurantiostomus*, holotype; 3, 4, *D. latitesta*, holotype.

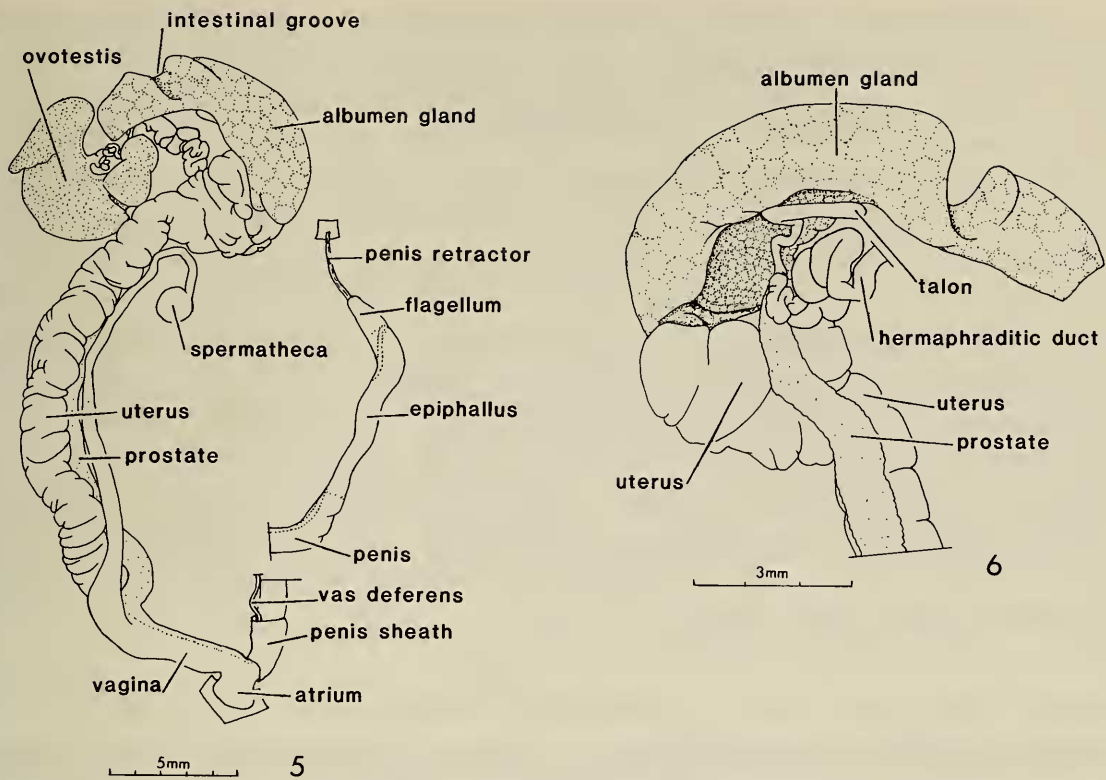
Measurements of holotype: shell height, 29.2 mm; shell width, 19.7 mm; aperture height 17.1 mm; aperture width, 16.0 mm.

Radula.—Lost during specimen preparation.

Reproductive system (Figs. 5, 6).—Ovotestis large, occupying nearly entire digestive gland and consisting of numerous closely packed alveolae. Hermaphroditic duct highly convoluted; lower half greatly swollen. Albumen gland 8.9 mm long, lying completely beneath right side of stomach, crescent-shaped with a deep transverse intestinal groove across distal end. Talon 3.6 mm long, club-shaped, flexed in middle, completely exposed. Carrefour lying along columellar side of albumen gland. Uterus about 30 mm long, voluminous and highly convoluted. Spermatheca globose, lying along columellar side of uterus beneath pericardium and just below junction of uterus and albumen gland. Spermathecal duct 23 mm long, tapered. Vagina 5.3 mm long, moderately voluminous. Atrium short. Penis about 7 mm long (severed during dissection but apparently recovered entire). Penis simple, slender, with 5 longitudinal branching pilasters internally; demarcated from epiphallus by slight internal constriction of lumen. Base of penis with a short thick penis sheath about 2 mm long. Epiphallus 7 mm long, slender, cylindrical, terminated by an epiphallic flagellum 1.6 mm long. Lumen of epiphallus with low, narrow tubercles anastomosing in lower portion; upper portion with 5–6 longitudinal branching pilasters that continue diminished into flagellum. Penis retractor muscle short, 3 mm, inserting on inner wall of lung about $\frac{1}{3}$ of distance from pericardium to mantle collar; originating on apex of flagellum. Vas deferens emerging at junction of epiphallus and flagellum, completely embedded in epiphallic and vaginal wall; partially exposed above penis sheath.

Type-locality.—Peru, Dept. Madre de Dios, Tambopata Reserve, on Rio Tambopata at Rio La Torre, about 30 km SSW Puerto Maldonado ($12^{\circ}49' S$, $69^{\circ}17' W$); 280 m alt. Holotype: UF 26605; collected 19 November 1979 by Roy W. McDiarmid on a shrub along the Tres Chimbadas Trail, about 20 minutes from the Explorers Inn.

Discussion.—The Bulimulidae are anatomically conservative. Subfamilies are weakly differentiated. Genera and subgenera usually differ only by shell characters, and occasionally by slight anatomical features. Studies on *Drymaeus* anatomy have failed to find anatomical traits that are useful for group classification (Strebel 1882; Baker 1925; Pilsbry 1946; Solem 1955; van Mol 1971; Breure 1976; Breure and Eskens 1977). Breure (1979) demonstrated that the digestive and reproductive systems in *Drymaeus* are highly conservative. Minor variations



Figs. 5–6. *Drymaeus aurantiostomus*, holotype: 5, Reproductive system; 6, Upper part of female system showing exposed talon. Scales in mm.

in the spermatheca, penis complex and radula have evolved independently in different species groups and have little phylogenetic significance, although they may be useful for comparing closely related species. It is apparent that in *Drymaeus* the shell is an adequate indicator of group relationships and specific distinctions. Data from other morphological systems have not provided a better basis for classification. The reproductive system of *D. aurantiostomus* is described so that other species may be compared with it. However, other members of the *expansus* group have not been studied anatomically.

D. aurantiostomus is related to a group of Andean species with a broadly expanded peristome and relatively rugose axial sculpture. The group includes *D. expansus* (Pfeiffer, 1848), and its subspecies *vanattai* Pilsbry, 1898, *balboa* Pilsbry, 1926, *subprotractus* Pilsbry, 1902, *flavilabrum* Weyrauch, 1967, *orcesi* Weyrauch, 1958, *altorum* Weyrauch, 1958 and *pereninus* DaCosta, 1901, as well as *D. inca* Smith, 1943, *D. latitesta* Haas, 1952, *D. protractus* (Pfeiffer, 1885), *D. bartletti* (Adams, 1866), *D. scitus* (Adams, 1885), *D. eusterius* Pilsbry, 1944, and *D. weeksi* Pilsbry, 1926. The group is widely distributed in the northern Andean region in Panama, Columbia, Ecuador, and Peru. *D. aurantiostomus* and *D. latitesta* are the southernmost members of the group and come from adjacent areas in Peru.

D. aurantiostomus is similar in shape and size to *D. expansus*. *D. expansus* differs by having more rugose sculpture, the peristome is not as protracted basolaterally, the color pattern consist of purplish flammulate blotches on a grayish white background, a basal band is absent, the interior of the aperture is purple tinted, and a subperipheral band is usually absent, except in some specimens in which the flames may fuse to form a band.

D. aurantiostomus is similar to *D. latitesta* Haas, a species described from Dept. Cuzco, Peru. The holotype of *D. latitesta* (FMNH 38120) (Figs. 3, 4) is a partly weathered specimen with a chipped peristome and broken apex, but important characteristics of shape and color pattern are clear. They are alike in having a subperipheral band that enters the aperture below the insertion of the outer lip (the band is faded on the front of the holotype of *D. latitesta*) and in having a basal band that enters the aperture at the insertion of the columellar lip. Both species have flammulate markings above the bands, though they are better defined and more periodic in *D. aurantiostomus*. *D. latitesta* differs from *D. aurantiostomus* in structure by having more inflated whorls with a more deeply impressed suture. It is larger (37.2 mm long), is more corpulent in shape, and the axial striations are weaker (Fig. 4). The columella is nearly vertical and the outer peristome is nearly uniformly arched. The plane of the aperture in lateral profile is vertical and basal in position, not tangential to the body whorl. The color pattern differs from that of *D. aurantiostomus* by having an additional suprapraperipheral band with flames above it (Fig. 4).

Literature Cited

- Baker, H. B. 1925. The Mollusca collected by the University of Michigan-Williamson Expedition in Venezuela. IV.—Occasional Papers of the Museum of Zoology University of Michigan 167:1–49, pls. 12–19.
- Breure, A. S. H. 1976. Notes on Bulimulidae (Gastropoda, Euthyneura): Some Bulimulidae from French Guyana and Surinam with notes on their anatomy.—Zoologische Mededelingen Rijksmuseum Natuurlijke Historie Leiden 50:107–115.
- . 1979. Systematics, phylogeny and zoogeography of Bulimulidae (Mollusca).—Zoologische Mededelingen Rijksmuseum Natuurlijke Historie Leiden (168): 1–215, pls. 1–3.
- , and A. A. C. Eskens. 1977. Observations on the formation of spermatophores in a bulimulid land snail, *Drymaeus canaliculatus* (Pfeiffer, 1845) (Mollusca, Gastropoda, Pulmonata).—Netherlands Journal of Zoology 27: 271–276.
- van Mol, J.-J. 1971. Notes anatomiques sur les Bulimulidae (Mollusques, Gastropodes, Pulmones).—Annales de la Société Royale Zoologique de Belgique 101:183–225.
- Pilsbry, H. A. 1946. Land Mollusca of North America (north of Mexico).—Monographs (3) Academy of Natural Sciences of Philadelphia 2(1): 1–520.
- Solem, A. 1955. Mexican molluscs collected for Dr. Bryant Walker in 1926, IX. *Drymaeus*.—Occasional Papers of the Museum of Zoology University of Michigan (566): 1–20, pls. 1–5.
- Strebel, H. 1882. Beitrag zur Kenntniss der Fauna mexikanischer Land—und Susswasser-Conchylien. Pt. 5. Orthalicidae. 1–144, pls. 1–19.—Hamburg.

Florida State Museum, University of Florida, Gainesville, Florida 32611.